DETAILED ACTION

Double Patenting

Claims 1-22 are provisionally rejected on the ground of nonstatutory double patenting over claims 1-18 of copending Application No. 10563693. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

The instant application claims "a mixed aluminum and silicon alkoxide only comprising hydrolyzable functions" and the copending application claims a mixture of hydrolyzable and non-hydrolyzable groups. The use of large numbers of hydrolizable groups contributes to the inorganic nature, albeit crystalline nature, of the aluminosilicate, the presence of non-hydrolizable groups such as (alkyl groups) contribute to the organic nature of the structure and would make it less crystalline.

It is common in the art to use aluminum alkoxides or silicon alkoxides with hydrolysable or non- hydrolysable groups and/ or mixtures in order to balance these two properties. It would have been obvious to one having ordinary skill in the art to have used hydrolysable or non-hydrolysable groups and/ or mixtures. The usage of hydrolysable or non- hydrolysable groups is commonly used to control the crosslink density (related to film durability and absorptivity) of the aluminosilicate network whether by exclusively selecting all hydrolysable groups, all non- hydrolysable groups or a mixture of hydrolysable/non- hydrolysable groups. These hydrolysable /non-

hydrolysable groups and the related combination thereof are well known in to the art and would be obvious.

Claims 1-22 are provisionally rejected on the ground of nonstatutory double patenting over claims 1-2, 5-16 and 23-25 of copending Application No. 10521898. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

The instant application claims "a mixed aluminum and silicon alkoxide only comprising hydrolyzable functions" and the copending application claims a mixture of hydrolyzable and non-hydrolyzable groups. The use of large numbers of hydrolizable groups contributes to the inorganic nature, albeit crystalline nature, of the aluminosilicate, the presence of non-hydrolizable groups such as (alkyl groups) contribute to the organic nature of the structure and would make it less crystalline.

It is common in the art to use aluminum alkoxides or silicon alkoxides with hydrolysable or non- hydrolysable groups and/ or mixtures in order to balance these two properties. It would have been obvious to one having ordinary skill in the art to have used hydrolysable or non-hydrolysable groups and/ or mixtures. The usage of hydrolysable or non- hydrolysable groups is commonly used to control the crosslink density (related to film durability and absorptivity) of the aluminosilicate network whether by exclusively selecting all hydrolysable groups, all non- hydrolysable groups or a mixture of hydrolysable/non- hydrolysable groups. These hydrolysable /non-

hydrolysable groups and the related combination thereof are well known in to the art and would be obvious.

The instant application claims the aluminum concentration being maintained at less than 0.3 mol/l and the copending application has an aluminum concentration being maintained at 1.4×10^{-2} and 0.3 mol/l. The instant application claims stirring the mixture at ambient temperature and the instant claim stirs the mixture from 15°C to 35°C. The examiner notes that in both cases the ranges essentially overlap.

Claims 1-22 are provisionally rejected on the ground of nonstatutory double patenting over claims 1-3, 5-14 of copending Application No. 10563694. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

The instant application claims "a mixed aluminum and silicon alkoxide only comprising hydrolyzable functions" and the copending application only comprising hydrolyzable functions. The use of large numbers of hydrolizable groups contributes to the inorganic nature, albeit crystalline nature, of the aluminosilicate, the presence of non-hydrolizable groups such as (alkyl groups) contribute to the organic nature of the structure and would make it less crystalline.

It is common in the art to use aluminum alkoxides or silicon alkoxides with hydrolysable or non- hydrolysable groups and/ or mixtures in order to balance these two properties. It would have been obvious to one having ordinary skill in the art to have used hydrolysable or non-hydrolysable groups and/ or mixtures. The usage of

hydrolysable or non- hydrolysable groups is commonly used to control the crosslink density (related to film durability and absorptivity) of the aluminosilicate network whether by exclusively selecting all hydrolysable groups, all non- hydrolysable groups or a mixture of hydrolysable/non- hydrolysable groups. These hydrolysable /non-hydrolysable groups and the related combination thereof are well known in to the art and would be obvious.

Claims 1-22 are provisionally rejected on the ground of nonstatutory double patenting over claims 1-18 of copending Application No. 10578205. This is a provisional double patenting rejection since the conflicting claims have not yet been patented.

The instant application claims "a mixed aluminum and silicon alkoxide only comprising hydrolyzable functions" and the copending application claims a mixture of hydrolyzable and non-hydrolyzable groups. The use of large numbers of hydrolysable groups contributes to the inorganic nature, albeit crystalline nature, of the aluminosilicate, the presence of non-hydrolizable groups such as (alkyl groups) contribute to the organic nature of the structure and would make it less crystalline.

It is common in the art to use aluminum alkoxides or silicon alkoxides with hydrolysable or non- hydrolysable groups and/ or mixtures in order to balance these two properties. It would have been obvious to one having ordinary skill in the art to have used hydrolysable or non-hydrolysable groups and/ or mixtures. The usage of hydrolysable or non- hydrolysable groups is commonly used to control the crosslink

density (related to film durability and absorptivity) of the aluminosilicate network whether by exclusively selecting all hydrolysable groups, all non- hydrolysable groups or a mixture of hydrolysable/non- hydrolysable groups. These hydrolysable /non-hydrolysable groups and the related combination thereof are well known in to the art and would be obvious.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Poncelet (WO/2004/009368) in view of Campell (6,409,334).

Regarding Claim 1, 3-7, 10, 11, 17 and 18, Poncelet teaches an ink jet element containing a support which can be made of polyester (page 5, line 5) and at least one ink-receiving layer, said ink-receiving layer comprising at least one hydrosoluble binder and at least one aluminosilicate polymer obtainable by a preparation method consisting in treating an aluminum halide with a mixture of at least one silicon alkoxide only having hydrolyzable substituents and at least one silicon alkoxide having a non-hydrolyzable substituent, with an aqueous alkali in the presence of silanol groups, the aluminum

concentration being maintained less than 0.3 mol/l, the Al/Si molar ratio being maintained between I and 3.6 and the alkali/Al molar ratio being maintained between 2.3 and 3; and then stirring the resulting mixture at ambient temperature in the presence of silanol groups for long enough to form the hybrid aluminosilicate polymer (page 3, lines 13-30; page 4, lines 1-24).

The examiner takes the position that one would be at liberty to use hydrolysable or non-hydrolysable groups and/ or mixtures for the intended application. It would have been a simple matter of selecting the appropriate aluminum or silicon compounds that did not contain alkyl substituents or some other non-hydrolysable group.

Poncelet discloses an ink receiving layer but fails to mention from what material the layer is composed.

Campell teaches an ink jet structure with a polyester support (column 7, line 55) composed of polyethylene terephthalate (column 4, line 33-35) and a porous ink permeable upper polyester layer comprising a continuous polyester phase. Campell further discloses that polyethylene terephthalate or poly(ethylene-1,4-cyclohexylenedimethylene terephthalate are used in the upper polyester layer (column 4, lines 19-26). Campell also discloses that such materials are commonly known in the art to serve in this function (column 4, lines 17-21). Campell discloses that the porous ink permeable upper polyester layer comprising a continuous polyester phase has an ink absorbency rate resulting in a dry time of less than about 10 seconds and a total absorbent capacity of at least about 14 cm^3/m^2 (column 2, lines 45-53). These values overlap with the range taught by the applicant.

Poncelet and Campell teach ink jet constructions with a polyester support and ink receiving layer. Poncelet does not teach the porous polyester ink receiving layer. Campell discloses an ink permeable upper polyester layer (ink receiving layer) comprising a continuous polyester phase having a good ink absorbency rate (column 2, lines 45-53) resulting in fast ink dry times and good image density (column 2, lines 58-59).

A person of ordinary skills in the art at the time of the invention would have been motivated by the use the teaching of Poncelet and Campell to combine a polyester support of Poncelet with the porous polyester ink receiving layer of Campell to achieve fast ink dry times and good image density.

Regarding Claim 2, Poncelet discloses the method for preparing the hybrid aluminosilicate (page 7, lines 26-27) involves an aqueous solution of sodium, potassium or lithium hydroxide (page 8, lines 4-5).

Regarding Claim 8, Poncelet discloses a preparation method that comprises treating a mixed aluminum and silicon precursor resulting from the hydrolysis of a mixture of aluminum compounds and silicon compounds only having hydrolyzable substituents and silicon compounds having a non-hydrolyzable substituent is a product form an aqueous alkali (pages 3, lines 21-24) where by the aluminum compound is selected from the group consisting of aluminum salts, aluminum alkoxides and aluminum halogenoalkoxides, at least one compound selected from the group

consisting of unmodified silicon alkoxides and chloroalkoxides, at least one compound selected from the group consisting of modified silicon alkoxides and chloroalkoxides. (page 6, lines 10-15).

The examiner takes the position that one would have full liberty to remove silicon compounds having non-hydrolyzable substituents resulting in the hydrolysis of a mixture of aluminum compounds and silicon compounds only having hydrolyzable substituents.

Regarding Claim 9, Poncelet discloses a recording element where the mixed aluminum and silicon compounds are made from a mixture (i) of an aluminum halide and (ii) a mixture with at least one silicon compound having hydrolyzable substituents and at least one silicon compound having non-hydrolyzable substituents (page 7, lines 1-3).

The examiner takes the position that one would have full liberty to remove silicon compounds having non-hydrolyzable substituents resulting in a mixture (i) of an aluminum halide and (ii) silicon compound having hydrolyzable substituents.

Regarding Claim 12-15, Poncelet discloses a modified silicon alkoxide can be represented by the formula R'-Si- (OR) 3, wherein R represents an alkyl group comprising 1 to 5 carbon atoms R' represents H, F, or a substituted or unsubstituted linear or branched alkyl or alkenyl group, comprising 1 to 8 carbon atoms, (e. g. a methyl, ethyl, n-propyl, n-butyl, 3-chloropropyl group, or a vinyl group), the modified (non-hydrolyzable) silicon alkoxide is methyltriethoxysilane or vinyltriethoxysilane, and,

the unmodified (hydrolyzable) silicon alkoxide is tetramethyl or tetraethyl orthosilicate (page 7, lines 4-14).

Regarding Claims 16, Poncelet discloses that the hybrid aluminosilicate in the ink receiving layer comprises 5 to 95 percent by weight of the dry state ink receiving layer (page 11, lines 28-30).

Regarding Claims 19-22, Poncelet does not disclose voiding agents in the porous upper polyester layer.

Campell teaches an ink jet structure with an ink-permeable upper polyester layer with voids that are interconnected or open-celled (column 3, 37-38). The voiding agent is present in the amount of 30-50% (column 4, lines 42-44). The voiding agent is selected from the group consisting of silica, alumina, calcium carbonate, and barium sulfate. Typical polymeric organic materials for the microbeads include polystyrenes, polyamides, fluoro polymers, poly(methyl methacrylate), poly(butyl acrylate), polycarbonates, or polyolefins (column 4, lines 45-50). The voiding agent size is between 0.1 to 50 microns (column 4, line 40).

Lui teaches an ink receiving layer formed on a polyester base and Campell teaches an ink receiving layer on a polyester base containing voiding agents. At the time of the invention a person of ordinary skill in the art with the teaching of Poncelet and Campell would be motivated to modify the ink receiving layer of Poncelet with the upper voided polyester layer taught by Campell since the voids taught by Campell lead

to efficient absorption of printed inks commonly applied to ink jet imaging supports without the need of multiple processing steps and multiple coated layers (column 3, lines 21-27).

Claims 1-8, 10-11 and 15-22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lui (6548149) in view of Cambell (6,409,334).

Regarding Claims 1, 3-8, 10-11 and 16-18, Lui discloses an ink recording element formed on a substrate composed of polyester (column 7, line 42-44), a binder and particles of silica prepared by wet method and/or aluminosilicate agglomerated with each other without binder (abstract). Lui discloses an ink receiving layer (called ink – permeable layer by applicant) formed from a list of thermoplastic polymers which include polyester resins (column 18, line 34). Lui further discloses that the ink receiving layer can be formed directly on the support (column 17, lines 28-30). Lui further discloses that the aluminosilicate can be produced by subjecting a mixture containing, as principal components, aluminum alkoxide and silicon hydroxide for a hydrolysis (controlled) procedure, and a complex mixture of products results comprising alumina moieties and silica moieties which are closely combined with each other to such an extent that these moieties cannot be isolated from each other. Usually, in the aluminosilicate particles, the alumina moieties (Al_2O_3) and the silica moieties (SiO_2) are contained in a weight ratio (Al/Si) of 1:4 to 4:1, preferably about 6:2 (column 9, lines 44-53).

The examiner takes the position that Lui demonstrates that the preparation of aluminosilicate is conducted by hydrolysis and results in a specific ratio range relative to Al/Si. One skilled in the art would conduct such a synthesis to produce the desired ratio similar to the applicant. Lui teaches the preparation of aluminosilicate and its use in ink receiving layers.

If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." (In re Thorpe, 227 USPQ 964,966). Once the examiner provides a rationale tending to show that the claimed product appears to be the same or similar to that of the prior art, although produced by a different process, the burden shifts to the applicant to come forward with evident establishing an unobvious difference between the claimed product and the prior art product (in re Marosi, 710 F.2nd, 802, 218 USPQ 289, 292 (Fed. Cir. 1983, MPEP 2113).

Lui fails to teach a porous polyester material used to make the ink receiving layer with an ink absorbency rate resulting in a dry time of less than about 10 seconds and a total absorbent capacity of at least about 14 cm^3/m^2.

Campell teaches an ink jet structure with a polyester support (column 7, line 55) composed of polyethylene terephthalate (column 4, line 33-35) and a porous ink permeable upper polyester layer comprising a continuous polyester phase. Campell further discloses that polyethylene terephthalate or poly(ethylene-1,4-cyclohexylenedimethylene terephthalate are used in the upper polyester layer (column 4, lines 19-26). Campell also discloses that such materials are commonly known in the

art to serve in this function (column 4, lines 17-21). Campell discloses that the porous ink permeable upper polyester layer comprising a continuous polyester phase has an ink absorbency rate resulting in a dry time of less than about 10 seconds and a total absorbent capacity of at least about 14 cm^3/m^2 (column 2, lines 45-53). These values overlap with the range taught by the applicant.

Lui and Campell teach ink jet constructions with a polyester support and ink receiving layer. Lui does not teach the porous polyester ink receiving layer. Campell discloses an ink permeable upper polyester layer (ink receiving layer) comprising a continuous polyester phase having a good ink absorbency rate (column 2, lines 45-53) resulting in fast ink dry times and good image density (column 2, lines 58-59). A person of ordinary skills in the art at the time of the invention would have been motivated by the teachings of Poncelet and Campell to combine the polyester support of Poncelet with the porous polyester ink receiving layer of Campell to achieve fast ink dry times and good image density.

Regarding Claim 2, Lui does not disclose the use of sodium, potassium and lithium hydroxide in the hydrolysis of the aluminum and silicon compounds.

The examiner takes the position the hydrolysis of metal alkoxide compounds is standard in the art and generally conducted under basic condition due to the instability of such material to acidic reaction medium. A person of ordinary skill in the art at the time of the invention would have full range to use a plethora of basic material to affect controlled hydrolysis which would include sodium, potassium or lithium hydroxide.

Regarding Claim 15, Lui discloses the use of tetraethyl orthosilicate in the preparation of aluminosilicate (column 23, lines 12-25).

Regarding Claim 19-22, Lui fails to teach an ink-permeable upper polyester layer with voiding agents.

Campell teaches an ink jet structure with an ink-permeable upper polyester layer with voids that are interconnected or open-celled (column 3, 37-38). The voiding agent is present in the amount of 30-50% (column 4, lines 42-44). The voiding agent is selected from the group consisting of silica, alumina, calcium carbonate, and barium sulfate. Typical polymeric organic materials for the microbeads include polystyrenes, polyamides, fluoro polymers, poly(methyl methacrylate), poly(butyl acrylate), polycarbonates, or polyolefins (column 4, lines 45-50). The voiding agent size is between 0.1 to 50 microns (column 4, line 40).

Lui teaches an ink receiving layer formed on a polyester base and Campell teaches an ink receiving layer on a polyester base containing voiding agents. At the time of the invention a person of ordinary skill in the art with the teaches of Lui and Campell would be motivated to modify the ink receiving layer of Lui with the upper voided polyester layer taught by Campell since voids taught by Campell lead to efficient absorption of printed inks commonly applied to ink jet imaging supports without the need of multiple processing steps and multiple coated layers (column 3, lines 21-27).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to GREGORY CLARK whose telephone number is (571)270-7087. The examiner can normally be reached on M-Th 7:00 AM to 5 PM Alternating Fri 7:30 AM to 4 PM and Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Larry Tarazano can be reached on (571) 272-1515. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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GDC